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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,725	07/28/2003	Ho-Jin Kweon	1567.1007D	7093
49455	7590	05/10/2007		
STEIN, MCEWEN & BUI, LLP 1400 EYE STREET, NW SUITE 300 WASHINGTON, DC 20005			EXAMINER CREPEAU, JONATHAN	
			ART UNIT 1745	PAPER NUMBER
			MAIL DATE 05/10/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/627,725

Applicant(s)

KWEON ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-20,22-24 and 38-40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-20,22-24 and 38-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. This Office action addresses claims 11-20, 22-24, 38, 39, and newly added claim 40. Although they have been amended, the claims remain rejected for substantially the reasons of record. This action is non-final.

### *Claim Rejections - 35 USC § 103*

2. Claims 11-20, 22-24, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-171813 in view of Maegawa et al (U.S. Patent 6,383,235).

JP '813 is directed to a rechargeable lithium battery comprising a lithiated positive electrode material. Regarding claim 12, the active material may comprise  $\text{LiCoO}_2$ ,  $\text{LiNiO}_2$ , or  $\text{Li}_x\text{Ni}_y\text{Co}_{1-y}\text{O}_2$  (see paragraph 24). The active material comprises a surface treatment layer on the lithiated core comprising a networked aluminum hydroxide/oxyhydroxide structure (see Figure 1). Regarding claim 18, in addition to aluminum, silicon or titanium may also be used (see paragraph 20). Regarding claims 11, 38, 39, and 40, the active material is made by a process of dissolving aluminum hydroxide in aqueous solution, coating the active material, and drying the coated compound at 120 degrees C for 2 hours (see [0036]). Regarding claim 13, an alcohol may also be used as a solvent (see [0022]).

The reference does not expressly teach that the drying is conducted at a temperature of approximately 60-100 degrees, as recited in claims 11, 38, 39, and 40.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to manipulate the drying temperature of JP '813 so as to fall within the claimed range. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). In this case, the 120 degree temperature disclosed by the reference appears to be merely exemplary, and the artisan would be sufficiently skilled to reduce the drying temperature to affect the composition and crystal structure of the surface coating. As such, the claimed temperature range is not considered to distinguish over the reference.

Regarding claims 19 and 20, which recite the concentration of coating material source in the solution, paragraph [0036] of the reference appears to disclose a concentration of about 10 weight parts of aluminum hydroxide. Accordingly, this disclosure is sufficient to render obvious the claimed range of 0.1-50 wt% (5-30%) in aqueous or organic solution.

Regarding claims 14 and 16, which recite that the mixture is "refluxed" to form the solution of coating material source, this limitation is not considered to distinguish over the reference. It would have been obvious to employ any means necessary to achieve good mixing and dissolution of the coating source material into the solvent. Accordingly, the step of "refluxing" the material would have been well within the skill of the art to employ to make the coating material solution.

Regarding claims 11, 38, 39, and 40, the drying step in JP '813 to evaporate the solvent can be characterized as "continuously increasing the temperature within the mixer." However, the reference does not expressly teach that the lithiated compound and the solution are "injected" into the mixer as recited in the claims.

Maegawa et al is directed to a method of forming a cathode material by spray-drying. In the method, two solutions are mixed and then sprayed (injected) into a spray-dryer with a compressed air flow (see Example 1).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the spray-dryer of Maegawa et al. to perform the mixing and drying of the material of JP '813. Regarding the mixing of the materials of JP '813, it would be obvious to employ any method that would result in sufficient mixing of the lithiated compound and the coating solution. Maegawa et al. is evidence of this, and discloses in numerous locations that its process and apparatus provides for good mixing between the solutions. Therefore, a skilled artisan would be motivated to use a spray dryer as suggested by Maegawa et al. to mix the materials of JP '813. Furthermore, the use of a compressed air stream to introduce the solution as disclosed in Maegawa would render obvious the subject matter of claim 22.

Regarding the limitation in claim 40 that "the coating and drying of the lithiated compound is performed simultaneously," it is submitted that the use of the spray-dryer of Maegawa would also render this limitation obvious. As disclosed in Maegawa, spray-drying

involves removal of the solvent as the materials are mixed. Thus, a coating and drying function are performed simultaneously.

Regarding the limitation that the coating step is performed under vacuum as recited in claim 23, this step would also be well within the skill of the art to perform in the method of JP '813 as modified by Maegawa. By performing an evacuating step in the spray-dryer, the net air flow through the spray-dryer would be increased and drying time would be reduced. Accordingly, this modification would be obvious to a skilled artisan.

Regarding claim 24, the sieving of the dried compound would be an obvious step in preparing the compound for use in a battery electrode.

### ***Double Patenting***

3. Claims 11-20, 22-24, and 38-40 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of U.S. Patent Nos. 6753111, 6797435, and 6846592 in view of Maegawa. Although the conflicting claims are not identical, they are not patentably distinct from each other because Maegawa renders obvious the mixing, coating and drying steps as set forth in the above rejection.

4. Claims 11-20, 22-24, and 38-40 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of copending Application No. 10/944892. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '892 application render obvious the instant claims (i.e., the instantly claimed temperature range).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

#### *Response to Arguments*

5. Applicant's arguments filed May 4, 2007 have been fully considered but they are not persuasive. Regarding the claimed temperature range of 60-100 degrees, Applicants state that unexpected results are achieved as illustrated in Tables 1 and 2 of the specification. However, this showing is not sufficient to obviate the outstanding rejection. JP '813 discloses an aluminum hydroxide/oxyhydroxide coating made by a drying process at 120 degrees. However, the instant specification does not contain an example of a similar composition but made at a different temperature, which would be required to show an unexpected result. The closest example is Comparative Example 4, which discloses an aluminum oxide layer made by a heat-treating process at 500 degrees. However, an aluminum oxide coating is not relevant to the claimed invention and is not disclosed by JP '813. As such, Applicant's contention of a showing of unexpected results is not persuasive, since the claimed invention has not been compared to the closest prior art (JP '813).

Regarding Maegawa, Applicants state that “there is no motivation or suggestion to combine JP '813 and Maegawa, since Maegawa teaches a method of preparing a positive active material along the prior art which requires a heat-treating step.” However, Maegawa is only relied upon as showing an apparatus and method for providing good mixing, as stated in the rejection. The artisan would be sufficiently skilled so as to not dry (i.e., heat treat) the material of JP '813 more than necessary, or the chemical composition of the surface layer of JP '813 would be altered. Accordingly, it is submitted that there is still motivation and a reasonable expectation of success in combining Maegawa with JP '813. Further, the drying step in Maegawa occurs during mixing to form a precursor, which is then sintered. When combining the references, a skilled artisan would not be motivated to perform the sintering step, as this would result in excessive heat-treatment of the material and alteration of its chemical structure.

### *Conclusion*

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau  
Primary Examiner  
Art Unit 1745  
May 8, 2007